

## IN THE CLAIMS

Claims 1 - 40 (**canceled**).

1        Claim 41 (**new**):    A system to collect image data which is representative of an  
2        aerial image of a mask used in the manufacture of integrated circuits, wherein the mask  
3        includes features having a line width, the system comprising:

4            an optical system to produce the image of the mask on a wafer plane;

5            a platform moveable between a plurality of discrete locations in a first direction and a  
6        plurality of discrete locations in a second direction;

7            an image sensor unit disposed on the moveable platform, the image sensor unit  
8        includes a sensor array located in the wafer plane, wherein the sensor array includes a  
9        plurality of sensor cells wherein each sensor cell includes an active area to sample light of  
10       a predetermined wavelength that is incident thereon, wherein the active area is smaller  
11       than the line width, and wherein at each discrete location of the platform the sensor cells  
12       samples the intensity of light;

13          a processing unit, coupled to the image sensor unit, to generate image data which is  
14       representative of the aerial image, wherein the processing unit generates the aerial image  
15       of the mask by interleaving the image data sampled by each sensor at each discrete  
16       location of the platform.

1        Claim 42 (**new**):    The system of claim 41 wherein the image sensor unit  
2        further includes:

3            a substrate wherein the sensor array is disposed on or in the substrate;

4 a film, disposed over selected portions of the active areas of the plurality of sensor  
5 cells to enhance the spatial resolution of each sensor cell wherein the film is comprised of a  
6 material that impedes passage of light of the predetermined wavelength.

1 Claim 43 (**new**): The system of claim 42 wherein the substrate includes a wafer-  
2 shaped profile.

1 Claim 44 (**new**): The system of claim 41 wherein the processing unit generates a  
2 first data set using the intensity of light sampled by each sensor cell when the platform is  
3 positioned at a first location relative to the aerial image, wherein the first data set includes  
4 data which is representative of the aerial image at locations corresponding to the locations  
5 of the sensor cells relative to the aerial image.

1 Claim 45 (**new**): The system of claim 44 wherein the processing unit generates a  
2 second data set using the intensity of light sampled by each sensor cell when the platform  
3 is positioned at a second location relative to the aerial image, wherein the second data set  
4 includes data which is representative of the aerial image at locations corresponding to the  
5 locations of the sensor cells relative to the aerial image.

1 Claim 46 (**new**): The system of claim 45 wherein the first location and the second  
2 location are adjacent locations along an axis in the first direction and wherein the distance  
3 between the first location and the second location is less than the distance between the two

4 opposing edges of the active area of each sensor cell of the sensor array, wherein the  
5 opposing sides are transverse to the axis.

1 Claim 47 (**new**): The system of claim 45 wherein the first location and the second  
2 location are adjacent locations along an axis in the first direction and wherein the distance  
3 between the first location and the second location is less than the diameter of the active  
4 area of each sensor cell.

1 Claim 48 (**new**): The system of claim 45 wherein the image sensor unit  
2 further includes:  
3 a substrate wherein the sensor array is disposed on the substrate;  
4 a film, disposed over the active areas of the plurality of sensor cells and comprised  
5 of a material that impedes passage of light of the predetermined wavelength, wherein the  
6 film includes a plurality of apertures which are arranged such that one aperture of the  
7 plurality of apertures overlies an associated active area of a corresponding sensor cell to  
8 expose a portion of the active area and wherein light of the predetermined wavelength is  
9 capable of being sensed by the portion of the active area that is exposed by the associated  
10 aperture.

1 Claim 49 (**new**): The system of claim 48 wherein the first location and the second  
2 location are adjacent locations along an axis in the first direction and wherein the distance  
3 between the first location and the second location is less than the distance between the two

4 opposing sides of each aperture, and wherein the opposing sides are transverse to the  
5 axis.

1 Claim 50 (**new**): The system of claim 48 wherein the first location and the second  
2 location are adjacent locations along an axis in the first direction and wherein the distance  
3 between the first location and the second location is less than the diameter of each  
4 aperture of the plurality of apertures in the film.

1 Claim 51 (**new**): The system of claim 50 wherein the diameters of the plurality of  
2 apertures are substantially equal.

1 Claim 52 (**new**): The system of claim 45 wherein the image sensor unit  
2 further includes:  
3 a wafer-shaped substrate wherein the sensor array is integrated in the substrate;  
4 a film, disposed over the active areas of the plurality of sensor cells and comprised  
5 of a material that impedes passage of light of the predetermined wavelength, wherein the  
6 film includes a plurality of apertures which are arranged such that one aperture of the  
7 plurality of apertures overlies a corresponding active area of a corresponding sensor cell to  
8 expose a portion of the active area and wherein light of the predetermined wavelength is  
9 capable of being sensed by the portion of the active area that is exposed by the  
10 corresponding aperture.

1           Claim 53 (**new**):   The system of claim 52 wherein the first location and the second  
2   location are adjacent locations along an axis in the first direction and wherein the distance  
3   between the first location and the second location is less than the distance between the two  
4   opposing sides of each aperture of the plurality of apertures, wherein the opposing sides  
5   are transverse to the axis.

6           Claim 54 (**new**):   The system of claim 52 wherein the first location and the second  
7   location are adjacent locations along an axis in the first direction and wherein the distance  
8   between the first location and the second location is less than the diameter of each  
9   aperture of the plurality of apertures in the film.

1           Claim 55 (**new**):   A system to collect image data which is representative of an  
2   aerial image of a mask used in the manufacture of integrated circuits, the system  
3   comprising:  
4       an optical system to produce the image of the mask on a wafer plane;  
5       a platform moveable between a plurality of discrete locations along a plurality of  
6   axes;  
7       an image sensor unit disposed on the moveable platform, the image sensor unit  
8   includes a sensor array located in the wafer plane, wherein the sensor array includes a  
9   plurality of sensor cells wherein each sensor cell includes an active area to sample light of  
10   a predetermined wavelength that is incident thereon and wherein at each discrete location  
11   of the platform the sensor cells samples the intensity of light; and

12 a processing unit, coupled to the image sensor unit, to generate image data which is  
13 representative of only a portion of the aerial image of the mask wherein the portion of the  
14 aerial image includes a plurality of non-contiguous sub-images and wherein the processing  
15 unit generates each sub-image of the plurality of non-contiguous sub-images using the  
16 intensity of light sampled by a corresponding sensor cell when the platform is positioned at  
17 a plurality of discrete locations relative to the aerial image.

1 Claim 56 (**new**): The system of claim 55 wherein the image sensor unit  
2 further includes:  
3 a substrate having a wafer-shaped profile, wherein the sensor array is disposed on  
4 the substrate;  
5 a film, disposed over selected portions of the active areas of the plurality of sensor  
6 cells to enhance the spatial resolution of each sensor cell wherein the film is comprised of a  
7 material that impedes passage of light of the predetermined wavelength.

1 Claim 57 (**new**): The system of claim 55 wherein the processing unit generates  
2 each sub-image using the intensity of light sampled by a corresponding sensor cell at a  
3 plurality of adjacent locations along a first axis and the intensity of light sampled by the  
4 corresponding sensor cell at a plurality of adjacent locations along a second axis.

1 Claim 58 (**new**): The system of claim 57 wherein the image sensor unit  
2 further includes:

3 a wafer-shaped substrate, wherein the sensor array is integrated in, or disposed on  
4 the substrate;

5 a film, disposed over the active areas of the plurality of sensor cells and comprised  
6 of a material that impedes passage of light of the predetermined wavelength, wherein the  
7 film includes a plurality of apertures which are arranged such that one aperture of the  
8 plurality of apertures overlies a corresponding active area of a corresponding sensor cell to  
9 expose a portion of the active area and wherein light of the predetermined wavelength is  
10 capable of being sensed by the portion of the active area that is exposed by the  
11 corresponding aperture.

1 Claim 59 (**new**): The system of claim 58 wherein the distance between adjacent  
2 locations of the plurality of locations along the first axis is less than the distance between  
3 the two opposing sides of each aperture of the plurality of apertures in the film, wherein the  
4 opposing sides are transverse to the first axis.

1 Claim 60 (**new**): The system of claim 58 wherein the distance between adjacent  
2 locations of the plurality of locations along the first axis is less than the diameter of each  
3 aperture of the plurality of apertures in the film.

1 Claim 61 (**new**): A system to collect image data which is representative of an  
2 aerial image of a mask used in the manufacture of integrated circuits, wherein the mask  
3 includes features having a line width, the system comprising:  
4 an optical system to produce the image of the mask on a wafer plane;

5 a platform moveable between a plurality of discrete locations;  
6 an image sensor unit disposed within the moveable platform, the image sensor unit  
7 includes a sensor array, wherein the sensor array includes a plurality of sensor cells  
8 wherein each sensor cell includes an active area to sample light of a predetermined  
9 wavelength that is incident thereon, wherein the active area is smaller than the line width,  
10 and wherein at each discrete location of the platform the sensor cells samples the intensity  
11 of light;  
12 a processing unit, coupled to the image sensor unit, to generate image data which is  
13 representative of the aerial image of the mask, wherein the processing unit generates the  
14 aerial image of the mask by interleaving the image data sampled by each sensor at each  
15 discrete locations of the platform.

1 Claim 62 (**new**): The system of claim 61 wherein the processing unit generates:  
2 a first data set using the intensity of light sampled by each sensor cell when the  
3 platform is positioned at a first location relative to the aerial image, wherein the first data set  
4 includes data which is representative of the aerial image at locations corresponding to the  
5 locations of the sensor cells relative to the aerial image; and  
6 a second data set using the intensity of light sampled by each sensor cell when the  
7 platform is positioned at a second location relative to the aerial image, wherein the second  
8 data set includes data which is representative of the aerial image at locations  
9 corresponding to the locations of the sensor cells relative to the aerial image, wherein the  
10 first location and the second location are locations on a first axis.



1           Claim 63 (**new**):    The system of claim 62 wherein the first location and the second  
2   location are adjacent locations along the first axis and wherein the distance between the  
3   first location and the second location is less than the distance between the two opposing  
4   edges of the active area of each sensor cell of the sensor array, wherein the opposing  
5   sides are transverse to the axis.

1           Claim 64 (**new**):    The system of claim 62 wherein the first location and the second  
2   location are adjacent locations along the first axis and wherein the distance between the  
3   first location and the second location is less than the diameter of each active area of the  
4   sensor cells.

1           Claim 65 (**new**):    The system of claim 62 wherein the image sensor unit further  
2   includes a film, disposed over the active areas of the plurality of sensor cells and comprised  
3   of a material that impedes passage of light of the predetermined wavelength, wherein the  
4   film includes a plurality of apertures which are arranged such that one aperture of the  
5   plurality of apertures overlies an associated active area of a corresponding sensor cell to  
6   expose a portion of the active area and wherein light of the predetermined wavelength is  
7   capable of being sensed by the portion of the active area that is exposed by the associated  
8   aperture.

1           Claim 66 (**new**):    The system of claim 65 wherein the first location and the second  
2   location are adjacent locations along the first axis and wherein the distance between the  
3   first location and the second location is less than the distance between the two opposing

4 sides of each aperture of the plurality of apertures in the film, wherein the opposing sides  
5 are transverse to the axis.

1 Claim 67 (**new**): The system of claim 66 wherein the first location and the second  
2 location are adjacent locations along the first axis and wherein the distance between the  
3 first location and the second location is less than the diameter of each aperture of the  
4 plurality of apertures in the film.

1 Claim 68 (**new**): The system of claim 62 wherein the processing unit generates:  
2 third data set using the intensity of light sampled by each sensor cell when the  
3 platform is positioned at a third location relative to the aerial image, wherein the third data  
4 set includes data which is representative of the aerial image at locations corresponding to  
5 the locations of the sensor cells relative to the aerial image; and  
6 fourth data set using the intensity of light sampled by each sensor cell when the  
7 platform is positioned at a fourth location relative to the aerial image, wherein the fourth  
8 data set includes data which is representative of the aerial image at locations  
9 corresponding to the locations of the sensor cells relative to the aerial image.

1 Claim 69 (**new**): The system of claim 68 wherein the third location and the fourth  
2 location are adjacent locations along a second axis and wherein the distance between the  
3 third location and the fourth location is less than the diameter of each active area of the  
4 sensor cells.

1           Claim 70 (**new**):    The system of claim 69 wherein the first location is adjacent to  
2   the third location along a third axis and wherein the distance between the first location and  
3   the third location is less than the diameter of each active area of the sensor cells.

1           Claim 71 (**new**):    The system of claim 70 wherein the image sensor unit further  
2   includes a film, disposed over the active areas of the plurality of sensor cells and comprised  
3   of a material that impedes passage of light of the predetermined wavelength, wherein the  
4   film includes a plurality of apertures which are arranged such that one aperture of the  
5   plurality of apertures overlies an associated active area of a corresponding sensor cell to  
6   expose a portion of the active area and wherein light of the predetermined wavelength is  
7   capable of being sensed by the portion of the active area that is exposed by the associated  
8   aperture.

1           Claim 72 (**new**):    The system of claim 71 wherein the second location and the  
2   fourth location are adjacent locations along a fourth axis and wherein the distance between  
3   the second location and the fourth location is less than the diameter of each aperture of the  
4   plurality of apertures in the film.